

XIII. A NEW SPECIES OF DEEP WATER SHARK
(*SQUALIOLUS SARMENTI*) FROM MADEIRA.¹

BY ADOLFO CESAR DI NORONHA.

(PLATE XXXV.)

In the present paper I give an account of a deep-sea shark taken in Madeiran waters during the month of September, 1923, by fishermen from the village of Cama de Lobos, with the lines they use for the capture of the common "*Peixe espada preto*" or Black Swordfish (*Aphanopus carbo* Lowe).

These long lines have procured for me, from the horizon of that fish, many interesting deep-sea species, some of them unknown to science, others rare, or at least not yet recorded from these waters. Among the latter I may in passing mention *Pseudotriacis microdon* Capello, *Centroscymnus obscurus* Vaillant, *Somniosus rostratus* (Risso), besides several other Teleostean fishes.

Of the species here described, a single female example was obtained, (C. M. Cat. Fishes, No. 7976a). It must have come from a depth, in all probability, of between about five hundred and eight hundred fathoms, for the *Aphanopus* fishing apparatus is formed of a long line suspended vertically, with some one hundred and fifty hooks fixed by short snoods along its lower part, from about five hundred fathoms below the surface as far as its end, which reaches far down, generally to a depth of eight hundred fathoms.

It belongs to the genus *Squaliolus*, lately described by Dr. Hugh M. Smith and Lewis Radcliffe, from the Philippines. (Proc. U. S. Nat. Mus. XLI, 684. Feb. 9, 1912.)

The genus may be thus defined:

¹The article herewith printed was submitted to the Editor of the Annals some time ago by Dr. David Starr Jordan. It was accompanied by a photograph showing the ventral aspect of the specimen, which is now the property of the Carnegie Museum. This view has been supplemented by a lateral view and both are reproduced upon Plate XXXV. W. J. HOLLAND.

Squaliolus Smith and Radcliffe.

. Squaloid sharks of very small size, the body elongate, little compressed, with thick head and slender caudal peduncle. Dermal scutella minute, not stalked, prismatic. Mouth little arched, a straight oblique groove running backward from its commissure. Teeth of different forms in each jaw, those in the lower few in number, all simple, their cusps with subrectangular bases, the cusps of the upper teeth erect, narrow, pointed; those of the lower jaw triangular, turned aside, their inner margins thus forming oblique incisorial edges; a median tooth with erect, equilateral cusp in the symphysis of lower jaw. Nostrils lateral-inferior, near the front margin of snout. No nictitating membrane. Spiracles superior, behind eyes. Anal fin absent; first dorsal fin with a small front spine hidden in the skin; second dorsal spineless, with a much longer base than that of the first; caudal fin well developed.

Very small sharks from deep water, nearly black in colour.

Squaliolus sarmenti Noronha, sp. nov. (Pl. XXXV)

Head 4.5 in length; depth 8 in snout; about 2.75 in head; eye 6 in head; about 2 in snout; 1.9 in width of snout; 3.4 in preoral portion of snout; space between spiracles equal to width of snout.

Body rather elongate, somewhat robust, rounded-trihedral in section, the upper and lower profiles describing a gentle curve as far as the ends of second dorsal and ventral fins, and thence proceeding in a straight line as far as the root of the caudal fin. The caudal trunk short, very slender in profile, flat above and below, depressed, subrectangular in section, all the lower region between the anus and caudal fin being flat.

Head narrow, thick, rounded above and below. Snout short, thick, narrow, a little more convex below than above, with an angular front margin. Upper part of head with—at each side of the median line—a very well-defined row of pores, which is continued by the lateral line. Eyes moderate, their anterior edge midway between end of snout and spiracles. Nostrils very large, nearer tip of snout than eye, the space between their inner ends being a little greater than half their own length. Mouth small, very slightly curved, on the vertical from posterior margin of eye-slit; labial fold extending a little way along upper margin of mouth; lips thin.

Teeth of the upper jaw presenting several rows in use at once, the cusps very narrow, sharp, conico-compressed; lower teeth 7 + 1 + 8 in number, showing a single row in use, their triangular cusps rather narrow, not very much inclined outward or backward, the upright mesial tooth not so high as the others.

The last of the small five branchial openings touching with its inferior end the front of the root of the pectoral fin.

The body, blackish brown above and slaty black below, is covered with a fine shagreen consisting of small sessile quadrangular tubercles, each with four ridges. The top of each tubercle has a pit in the centre and four heads in the periphery corresponding to the four ridges. Excepting the caudal fin, which is in the greater part scaly, all fins are covered with tubercles only at their bases. They have their free edges white, the larger part of the surface of the pectorals, ventrals, and second dorsal, being of that colour.

The first dorsal fin has its origin nearer the pectorals than the ventrals, and bears in its anterior border concealed in the skin a small spine, a third as high as the front margin of the fin. The second dorsal unarmed, with a fleshy base a little shorter than three times that of the first dorsal, its vertical height equal to two thirds of the said second dorsal. Pectorals subrectangular not short, almost naked and white, their end nearly reaching the vertical from the dorsal spine. Ventral fins, with fleshy base, a little higher than second dorsal, their length a little greater than half of the same dorsal, the distance of their origin from the tip of snout equal to two thirds of the total length of the fish. Caudal fin not far from homocercal, the tail entering into it in a straight line and very slightly bending upwards only at its end; the two lobes triangular, both developed, almost symmetrical.

The species is named after my old friend, Prof. Alberto Arthur Sarmiento, the Madeiran naturalist, who has been engaged here for many years in the diffusion of knowledge of natural science.

From the Philippine species, *Squaliolus laticaudus* Smith and Radcliffe, *Squaliolus sarmenti* seems to differ in the more posterior insertion of the first dorsal. In *Squaliolus laticaudus* the distance from snout to first dorsal is 2.1 in length to base of caudal; in *S. sarmenti* it is 2.4. The pectoral in *S. laticaudus* reaches well past front of first dorsal; in *S. sarmenti* only to the concealed spine. The distance from spiracles to insertion of first dorsal is 3.6 in body in *S. laticaudus*; 4 in *S. sarmenti*.

The following are the dimensions of the example obtained:

BODY: Total length.....	246 mm.
Greatest height (under first dorsal).....	31 mm.
Height of caudal peduncle.....	5 to 6 mm.
HEAD: Length.....	54 mm.
Width at spiracles.....	23 mm.
Length of snout.....	19 mm.
Width of snout (near anterior margin of eye).....	17 mm.
Preoral portion of snout.....	31 mm.
Diameter of eye.....	9 mm.
Interorbital space.....	19 mm.

FIRST DORSAL: Distance from snout.....	92 mm.
Length of base.....	10 mm.
Vertical height.....	7 mm.
Length of anterior margin.....	12 mm.
Length of spine.....	4 mm.
SECOND DORSAL: Distance from end of first dorsal.....	70 mm.
Length of base.....	27 mm.
Vertical height.....	5 mm.
PECTORALS: Distance from snout.....	62 mm.
Width of base.....	8 mm.
Length.....	21 mm.
VENTRALS: Distance from snout.....	162 mm.
Length of base.....	15 mm.
Vertical height.....	6 mm.
CAUDAL: Distance from end of second dorsal.....	16 mm.
Distance from end of ventrals.....	40 mm.
Length.....	31 mm.
Height.....	36 mm.

Comparing this species with the Madeiran members of the squaloid group, we find that its dermal denticles are quite of the same model as *Etmopterus pusillus* (Lowe), only they are comparatively larger in the present species, for the larger specimens of *E. pusillus* of our collection, some of them not less than 47 centimetres in length, have dermal scutella of the same absolute size. The nearly naked paired and dorsal fins, all with white margins, are further features common to the two species considered.

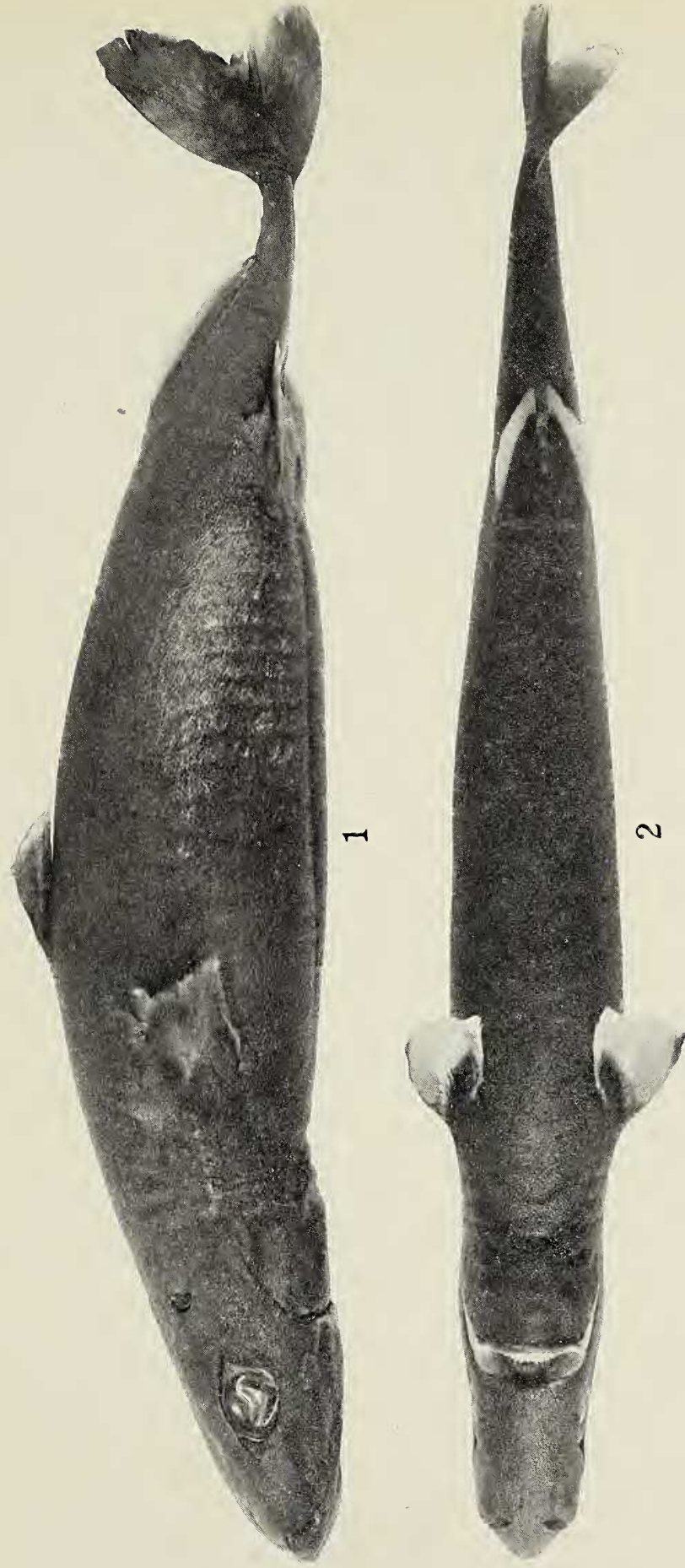
The lower teeth, apart from their entire edges, by their reduced number, their inclination and the presence of a mesial tooth, approach those of *Scymnorhinus licha* (Bonnaterre); but, more exactly, they approach nearer to those of *Centroscymnus obscurus*, Vaillant, and of *C. crepidater* (Bocage and Capello), than *S. licha*, in which species the lower teeth deviate little from the upright position. On the other hand, the upper teeth present a closer resemblance by their conical pointed cusps to those of *S. licha* and *C. crepidater* than to any other species, but the upper jaw describes a single arch, as it happens generally, and not a sinuosity, as is the case with the genus *Centroscymnus*.

The family place of this genus of sharks is not difficult to find, and depends only on the way by which systematists treat the sharks of the squaloid group. If we accept a single family, the *Squalidæ*, including not only all forms with two dorsal spines, but also those which are spineless, this new form is entitled to enter there immediately, without any objection. But if the group must comprise more

than one family, characterized either by the presence of two dorsal spines, or by the total absence of them, in this case, as *Squaliolus* has a single very small dorsal spine, a new family, the *Squaliolidae*, must be recognized.

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Cruces, Funchal, Madeira, November, 1923.



Squaliolus sarmeni Noronha, ♀ (About three-fourths Nat. size) Caught Madeira Islands, Sept. 27, 1923.